**Individual Project due 24 :00 7 October, 2012 (to be loaded onto your wiki).**

**Name:** Aung Zaw Oo

**Project** - Thin client network for a small school + NAS

<http://www.officeworks.com.au/retail/products/Technology/Data-Storage/Network-Attached-Storage/QNTS212>



The project could concentrate on installing a thin client network for a small school with solar panels, gel batteries, inverter and a small network of 20 desktop PC’s which may include a server, printer and other necessary equipment. The proposed network provides service to a classroom that has fluorescent lighting. Classes operate between the hours 8.30am to 3.30pm (7.00 hours)

Assumptions:

• The existing computer network is ON 5 days per week 24 hours per day

• The existing classroom lighting is ON 5 days per week 10 hours per day

**Individual Project**

1. Negotiate with the stakeholders to establish the extent to which sustainability is to be integrated

Answer:

**Hardware**

□ renewable energy source

□ low powered hardware

□ energy efficient architecture

Summary: My Individual Project uses ….

**Software**

□ energy management software

**Printing**

□ local

□ online

□ to Pdf/wiki

2. Advise short term technology solutions to achieve reduction of power consumption

Answer:

* Replace low power consumption hardware (e.g. Server, Workstation, Printer)
* Change energy efficient working environment (e.g. Data Centre design, Lighting, Cooling System)

3. Identify energy usage within the scope of the ICT project and provide a detailed report

Answer:

|  |  |  |
| --- | --- | --- |
| **Condition** | **Power consumption**  **(watts)** | **Notes** |
| OFF | 0 |  |
| MAX BOOT (with 2 x 500GB HDD installed) | 13 watt |  |
| IDLE (Sleep Mode) | 6 watt |  |
| Wordprocessing | N/A |  |
| Spreadsheets | N/A |  |
| Web browsing  <http://news.bbc.co.uk/2/hi/programmes/click_online/default.stm> | N/A |  |
| Low level music  <http://grooveshark.com/#/s/Fall+At+Your+Feet/3KIZB0?src=5> | N/A |  |
| Low level video  <http://www.joost.com/39w1yk49/#/?video_info=33p1yw1t> | N/A |  |
| Monitor | N/A |  |
| Printing | N/A |  |
| NAS (**TS-212 Turbo NAS)** (<http://web.qnap.com/pro_detail_feature.asp?p_id=192>) | 60 watt |  |

**PowerPoint Presentation**

Create a PowerPoint presentation of your individual Project with the following slides:

1. The Basics of preparing to integrate sustainability into ICT planning and design projects;
2. ICT sustainability from a business standpoint;
3. Energy efficiency as a stepping stone to sustainability;
4. Individual Project Strategy
5. Network operation and security;
6. Sketch of the recommended project system;
7. Test results
8. Short term technology solutions to achieve reduction of power consumption;
9. Energy usage within the ICT project - graph
10. Recommendations and Conclusion.

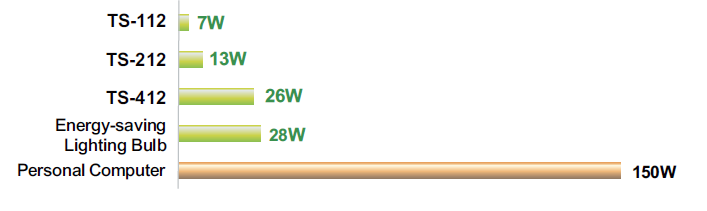
**Individual Report**

**For your individual project answer the following:**

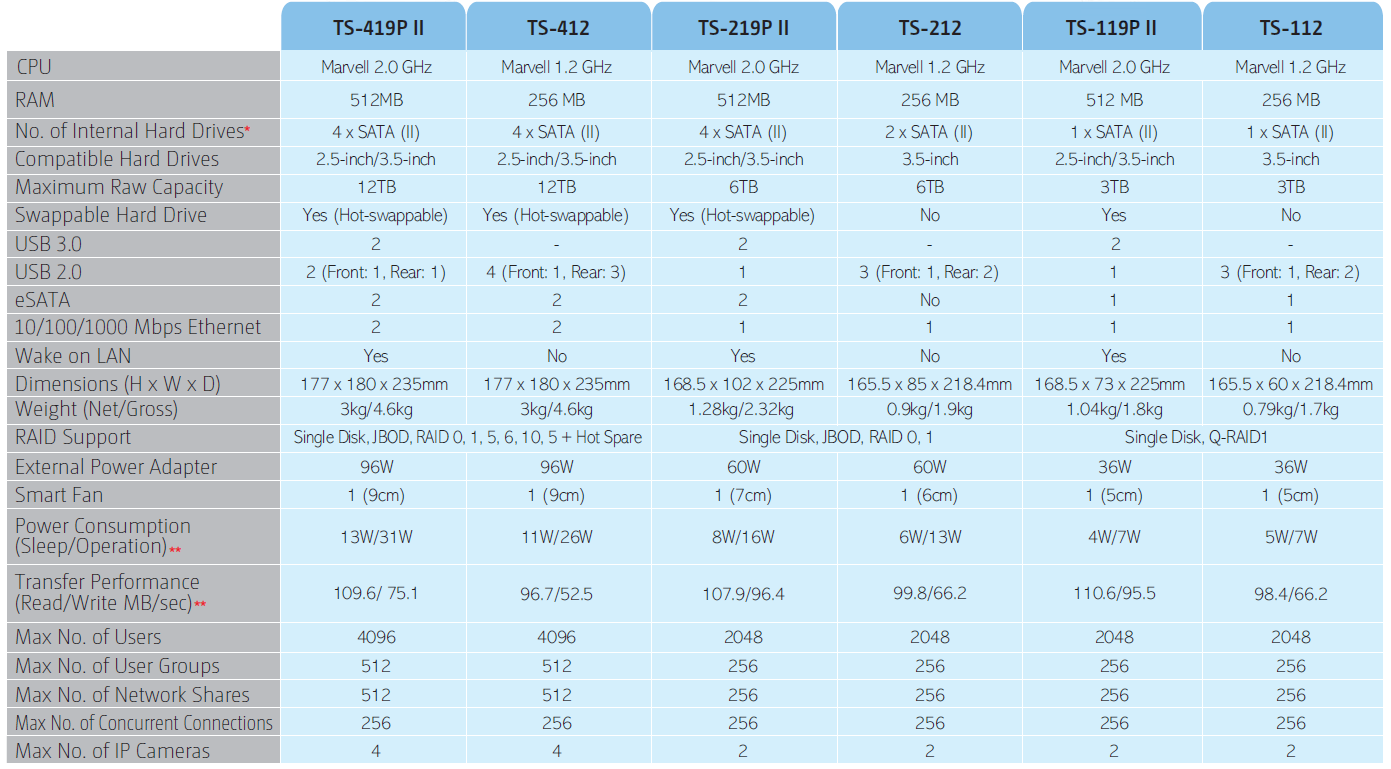
1. Explain how sustainability can be integrated into your individual Project

By using the low power consumption hardware and power saving software can be integrated to reduce the carbon emission.

1. Research and identify suitable technology solutions applicable to the project



1. Explain the power consumption data compared to benchmarks



1. Advise how sustainable management principles may be applied to your individual project resulting in reduced environmental impact

* QNAP Turbo NAS features the latest green technologies to protect the environment and save money on your energy bill.
* The hard drives on the NAS can be configured to enter standby mode after a period of idling to reduce the power consumption and extend their lifespan.
* The smart fan monitors the server and hard drive temperature and automatically adjusts the fan speed for quiet 24/7 operation.
* The NAS can be scheduled for automatic power on and off to save energy when no data access is required.

1. Provide key performance indicators (KPI) - sustainability performance for your individual Project

**Key Performance Indicators**

|  |  |  |  |
| --- | --- | --- | --- |
| **Hardware** | **SD-KPI 1: Energy / greenhouse gas efficiency of production / products in use**  **(tons CO2)** | **SD-KPI 2: Proportion of products with “Design for Environment” / Eco-Label**  **(√) or (x)** | **SD-KPI 3: Emissions of (hazardous) waste and toxic materials**  **Yes or No** |
| TS-212 Turbo NAS  <http://web.qnap.com/pro_detail_feature.asp?p_id=192> | 0.013x24x365 x6.89560/10000=  0.078527 | **√** | **Yes** |

1. Advise what actions could improve the KPI’s for your Individual Project which foster sustainability and environmental best practice

ENERGY STAR products have helped save energy, save money and reduce their carbon footprints. Using best Energy star rating hardware (hard drives) and software (power management).

1. Evaluate the estimated CO2 emissions with comparable benchmarks; and
2. Estimate the carbon dioxide (CO2) emissions for the Individual Project; and Individual Project + Recommended Actions

|  |  |  |  |
| --- | --- | --- | --- |
| **Hardware** | **Benchmark**  **(tons CO2)** | **Individual Project**  **(tons CO2)** | **Individual Project**  **+**  **Recommended Actions**  **(tons CO2)** |
| NAS | TS-419P II  <http://web.qnap.com/pro_detail_feature.asp?p_id=212>  0.013x24x365 x6.89560/10000=  0.1872569136 (Maximum)  0.013x24x365 x6.89560/10000=  0.078527 (Minimum) | TS-212 Turbo NAS  <http://web.qnap.com/pro_detail_feature.asp?p_id=192>  0.013x24x365 x6.89560/10000=  0.078527 (Maximum)  0.006x24x365 x6.89560/10000=  0.036243 (Minimum) | With 500GB (SATA II hard drive) |

1. Make recommendations in order of priority and give estimates of implementation costs on integration of sustainability for other ICT projects; and
2. Estimate potential energy savings and payback periods for recommended actions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Recommendation** | **Priority** | **Implementation Cost** | **Energy Saving** | **Payback Period** |
| TS-212 Turbo NAS  <http://web.qnap.com/pro_detail_feature.asp?p_id=192> | High | AUD299.00 | Yes | AUD100 per annual |
| Momentus 7200.4 SATA 3Gb/s 500-GB 16MB x 2  <http://www.itspot.com.au/seagate-momentus-72004-sata-3gbs-500-gb-16mb-p320212.html> | High | AUD86.00 x 2 (AUD172.00) | Yes | AUD50 per annual |